COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Northern Virginia Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

Washington Gas Springfield Operations Center
Springfield, Virginia
Permit No. NVRO70151

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Washington Gas has applied for a Title V Operating Permit for its Springfield Operations Center (Cogeneration Plant). The Department has reviewed the application and has prepared a draft Title V Operating Permit.

Engineer/Permit Contact:_____ Date: November 19, 2001

Air Permit Manager:_____ Date: November 19, 2001

Regional Permit Manager:_____ Date: November 19, 2001

FACILITY INFORMATION

Permittee
Washington Gas
6801 Industrial Road
Springfield, VA. 22151

Facility
Springfield Operations Center
6801 Industrial Road
Springfield, VA. 22151

AIRS ID No. 51-059-0056

SOURCE DESCRIPTION

SIC Code: 4924 – Natural Gas Distribution

All electricity, space and water heating, and air conditioning used at the Springfield Operations Center is produced at a Cogeneration Plant located on site. The Cogeneration Plant consists of six Caterpillar generators, each driven by a natural gas-fired engine rated at a nameplate capacity of 930 horsepower (857 hp de-rated), and three natural gas-fired Cleaver Brooks heat recovery boilers, each rated at 10.46 million BTU per hour. The units are configured such that two generators are linked to one boiler resulting in three sets of two generators and one boiler. The exhaust gases from each set of two generators are sent to a single boiler for recovery of heat and eventual exit through a single boiler stack. Each generator exhaust column is equipped with a Johnson Matthey Catalytic Converter to control oxides of nitrogen. Auxiliary equipment consists of a natural gas-fired Hitachi Chiller, rated at 9.6 million BTU per hour, a diesel-fired Cummins Emergency Generator rated at 268 horsepower and a diesel-fired Volvo Emergency Generator rated 749 horsepower.

The facility is a Title V major source of nitrogen oxides (NO_x) and carbon monoxide (CO), and is a PSD major source for CO. This source is located in a Fairfax County Virginia, which is part of the Northern Virginia Ozone Nonattainment Area, and is classified as Serious nonattainment for ozone. As a result, the source is a nonattainment major source for NO_x. The county and region is in attainment with the National Ambient Air Quality Standards (NAAQS) for all other criteria pollutants. The source has never been issued a new source review permit but is currently operating under the authority of two Consent Agreements, dated and signed by DEQ on April 3, 1998. The Consent Agreements establish Reasonably Available Control Technology (RACT) for NO_x and have been approved by the Environmental Protection Agency (EPA) and incorporated into Virginia's State Implementation Plan (SIP) .

COMPLIANCE STATUS

The facility is inspected once per year by the Virginia DEQ. The last inspection was conducted on July 12, 2001. The facility was determined to be in compliance with RACT and all other requirements.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units at this facility consist of the following:

Table 1. Significant Emission Units at Springfield Operations Center

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
Fuel Burning Equipment							
01	01	Caterpillar Generator No. 1, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 01 exhaust	011	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
02	01	Caterpillar Generator No. 2, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 02 exhaust	012	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
03	01	Cleaver Brooks Boiler No. 1, natural gas-fired (began operation in 1969)	10.46 MMBtu/hr	---	---	---	None
04	02	Caterpillar Generator No. 3, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 04 exhaust	013	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
05	02	Caterpillar Generator No. 4, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 05 exhaust	014	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
06	02	Cleaver Brooks Boiler No. 2, natural gas-fired	10.46 MMBtu/hr	---	---	---	None

Emission Unit ID	Stack ID	Emission Unit Description	Size/Rated Capacity*	Pollution Control Device (PCD) Description	PCD ID	Pollutant Controlled	Applicable Permit Date
		(began operation in 1969)					
07	03	Caterpillar Generator No. 5, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 07 exhaust	015	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
08	03	Caterpillar Generator No. 6, Model G399 engine, natural gas-fired (began operation in 1969)	930 horsepower	Johnson Matthey Catalytic Converter on Emission Unit 07 exhaust	016	NO_x	NO_x RACT Consent Agreement dated April 3, 1998
09	03	Cleaver Brooks Boiler No. 2, natural gas-fired (began operation in 1969)	10.46 MMBtu/hr	---	---	---	None

EMISSIONS INVENTORY

A copy of the 2000 annual emission statement is enclosed as Attachment A. Emissions from the Emission Units presented in Table 1 and the Insignificant Emission Units presented in Table 3 are summarized in the following tables.

Table 2. 2000 Actual Criteria Pollutant Emissions

Emission Unit	2000 Criteria Pollutant Emissions (tpy)				
	VOC	CO[1]	SO_2	PM_{10}	NO_x
01	0.93	37.0	---	0.87	10.91
02	0.76	30.4	---	0.72	8.99
03	---	0.01	---	0.0	0.04
04	0.84	33.7	---	0.79	9.91
05	0.79	31.6	---	0.75	9.32
06	---	0.01	---	0.0	0.04
07	0.64	25.5	---	0.56	7.52
08	0.98	39.2	---	0.93	11.6
09	---	0.01	---	0.0	0.04
All others	0.08	0.38	0.04	0.07	1.5
Total	5.02	197.8	0.04	4.73	59.9

[1]: CO emissions are not required to be reported in annual Emission Statements. As a result, annual CO emissions were calculated by DEQ using appropriate emission factors obtained from the application and operational data provided in the annual Emission Statement.

Emission statements only require the estimates of actual hazardous air pollutants (HAPs) which are non-VOC and non-PM based. There were no HAPs of this kind emitted in reportable quantities at the Springfield Operations Center in 2000. Actual HAP emissions of all kinds emitted from significant Emission Units totaled less than 150 pounds in 2000. Due to this low level of emissions, no additional emissions information on HAPs is provided.

EMISSION UNIT APPLICABLE REQUIREMENTS – Internal Combustion Engines (Emission Units 01, 02, 04, 05, 07, and 08)

This section identifies requirements established in two Consent Agreements developed to implement NO_x RACT. Copies of the Consent Agreements are enclosed in Appendix B. These requirements are part of a case-by-case NO_x RACT, which was approved by EPA and incorporated into Virginia's SIP. These requirements are currently State-only enforceable, but will become federally enforceable upon EPA's approval of the RACT into the SIP.

Limitations

- NO_x RACT limit of 2.0 grams per horsepower hour per engine, established in Condition E.2 of the April 3, 1998 Consent Agreement (NVRO-031-98) between DEQ and Washington Gas.

- 9 VAC 5-40-80 of the Virginia Administrative Codes establishes a visible emissions limit of . 20% opacity at all times except for any six-minute period in any one-hour not to exceed 60% opacity. However, this applicable requirement is contained within IV.A.3 since the exhaust from the internal combustion engines is piped directly to the boilers (Emission Units 03, 06 and 09) for heat recovery. The combined exhaust from the internal combustion engines and boilers exit through the boiler stacks (Stack ID 01, 02 and 03).

Monitoring

Conditions III.B.1 through III.B.4 of the permit establish a periodic monitoring plan to provide a reasonable assurance of continuous compliance with the NO_x limit of 2.0 g/hp-hr contained in Condition III.A.1. These conditions are based on a parametric monitoring plan completed by Washington Gas as part of compliance with Condition E.4 of the Consent Agreements. This plan was approved by DEQ on June 11, 1999, and modified to meet the periodic monitoring requirements of Part 70. The parametric monitoring plan is enclosed in Appendix C.

A parametric monitoring plan is a useful means of assessing ongoing compliance when a control device is used to meet compliance with a limit. This type of approach is valid when the initial performance test shows compliance by a wide margin and relevant surrogate parameters can be monitored during the test and over the life of the control device. The results of the initial compliance test showed that average NO_x emissions of 0.124 g/hp-hr were a fraction of the 2.0 g/hp-hr limit. The parametric monitoring plan developed for the Consent Agreements established differential temperature and pressure across the catalyst in combination with periodic NO_x analysis as the basis of the plan. In addition, the plan provides a means to assess the proper operation of the engines, as well as the catalyst, and provide corrective actions on the catalyst and/or the engines when problems occur.

A summary of the periodic monitoring approach for NO_x is as follows:

- Washington Gas developed curves of engine load versus differential pressure and temperature across the catalyst after completion of a successful initial compliance demonstration and during the catalyst's initial six months of operation. On a daily basis, operators will monitor both parameters and compare them to the curves. If monitored values are out of range (i.e., above the pressure curve or below the temperature curve), the source will take a step to first

corroborate the initial exceedance, and the take a series of steps to identify and correct the problem.

- Every six months, Washington Gas will be required to determine NO_x emissions using a portable NO_x analyzer. The results will be used to determine compliance with the RACT limit and be used to verify the temperature and pressure versus engine load curves. Adjustments to the curves will be made as necessary.
- Once during the term of the permit, a minimum of two engines will be tested using a Reference Method test.
- In addition, a condition was added to require that the engines be operated and maintained properly, and that operators be trained in the proper operation of the engines. This also serves to satisfy adequate periodic monitoring for the visible emissions limit. An exceedance of the visible emissions standard is highly unlikely so long as pipeline grade natural gas is used and the engines are operated properly. This position is supported by the September 15, 1998 EPA memorandum from Eric Schaeffer and John Seitz, entitled "Periodic Monitoring Guidance for the Title V Operating Permits Program."

Record keeping

The permit includes requirements for maintaining records of all monitoring and testing required by the permit. These records include the following:

- Daily differential temperature and pressure measurements across the catalyst and engine load,
- Differential temperature and pressure measurements made during periods of corrective action,
- Original and adjusted curves of differential temperature and pressure versus engine load,
- NO_x emissions and related parameter measurements, made using the portable analyzer during the bi-annual testing and during periods of corrective actions,
- Natural gas consumption,
- Records of scheduled and unscheduled maintenance, and
- Records of operator training.

All records are required to kept on-site for inspection by DEQ and be current for the most recent 5 years. Operator training records shall be up to date for the current group of operators.

Testing

The permit requires the permittee to conduct and EPA reference method test, identified in the permit, to determine compliance with the NO_x limit once during the permit term. The testing is required on a minimum of two of the six engines.

Reporting

The permit requires reporting of the following:

- Emission excursions,
- Compliance test results,
- Semi-annual reporting of daily differential temperature and pressure readings, data recorded during periods of corrective actions, and semi-annual NO_x results as required of all monitored parameters in the General Requirements section of the permit.

The permit establishes reporting schedules for all of the above items.

Streamlined Requirements

The majority of the requirements contained in the NO_x RACT Consent Agreements have been met or are continuously being met. As a result, most of the conditions of the Consent Agreements are irrelevant or obsolete and have not been included or referenced in the permit or addressed in this document. The exceptions are Condition E.2 and E.5 of NVRO-031-98, and Condition E.4 of both Consent Agreements. Condition E.2 contains the NO_x RACT emission limit and has not been streamlined. Condition E.4 required development of a parametric monitoring plan which has already been submitted and approved by DEQ. However, Condition E.4 is cited in this operating permit as the basis of the several monitoring provisions covering periodic monitoring of the NO_x limit. Condition E.5 has several applicable requirements which have been streamlined by the permit as follows:

- Condition E.5 of the NVRO-031-98 Consent Agreement requires Washington Gas to submit annual reports of RACT non-compliant activity. This condition is streamlined by Condition III.E.1 (specific to the engines) and General Condition VII.E of the permit, which requires emissions excursions and permit deviations to be reported.
- Condition E.5 of the Consent Agreement also requires that logs be kept of the daily differential temperature and pressure measurements. This is streamlined by Condition III.C.1 of the permit, which requires recording of daily differential temperature and pressure measurements.
- Additionally, Condition E.5 of the Consent Agreement requires an annual report demonstrating compliance with all RACT requirements. This reporting requirement has been streamlined as part of the annual compliance certification General Condition VII.D. Compliance with the conditions of the Title V permit ensure compliance with the RACT requirements in the Consent Agreement.
- Finally, Condition E.5 of the Consent Agreement requires that daily records be kept for the most recent five years and be made available for inspection. The record keeping provisions contained in Section III.C of the permit provide for this.

EMISSION UNIT APPLICABLE REQUIREMENTS – Boilers (Emission Units 03, 06, and 09)

Limitations

Emissions from the boilers are regulated by 9 VAC Chapter 40, Article 8 – Emission Standards for Fuel Burning Equipment. These regulations apply to existing fuel burning units and set emission limits for sulfur dioxide, particulate matter and visible emissions. These standards were calculated as follows:

Sulfur dioxide 9 VAC 5-40-930 A(2) applies to the fuel burning equipment installation as follows:

S = 1.06 k, where k is the total capacity of applicable fuel burning units
S = 1.06 (10.46 MMBtu/hr x 3 units) = 33.3 lb/hr

Particulate Matter: There are two separate emission limits for particulate matter.
9 VAC 5-40-900 A applies to the fuel burning equipment installation and is 0.3 lb/MMBtu.

9 VAC 5-40-900 B applies to each emission unit and is calculated as follows:
PM limit = 10.46 MMBtu/hr x 0.3 lb/MMBtu = 3.1 lb/hr.

Visible Emissions: 9 VAC 5-40-940 sets a visible emissions standard of 20 % opacity at all times except for any six-minute period in any one-hour not to exceed 60 % opacity. This visible emission limit also indirectly applies to the exhaust from the internal combustion engines (Emission Units 01, 01, 04, 05, 07 and 08). Their exhaust is piped directly to the boilers for heat recovery and the combined exhaust from the boilers and internal combustion engines exit through the boiler stacks (Stack ID 01, 02 and 03).

Monitoring and Record keeping

So long as the units are properly operated, maintained, and are fueled by pipeline natural gas, it is highly unlikely that the emission standards for sulfur dioxide, particulate matter, or visible emissions will be exceeded. This position is supported when calculating worst-case emissions based on the most up to date emission factors for natural gas combustion in external combustion sources as obtained from Chapter 1.4 of AP-42, 5th edition.

Proper operation and maintenance of the boilers, as required by Condition IV.B.1 of the permit, will ensure that these emission limits are not approached. This condition also requires the source to train the boiler operators in the proper operation and maintenance of the emissions units. Records of the training and all scheduled and unscheduled maintenance are required to be kept for all operators to ensure that the proper training has been conducted.

Testing

The permit does not require source emissions tests. A table of test methods has been included in the permit if testing is performed. The DEQ and EPA have the authority to require testing not included in this permit if necessary to determine compliance with an emission limit or standard.

Reporting

No specific reporting requirements have been included in this permit.

Streamlined Requirements

Streamlining of applicable requirements was not necessary.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within one business day.

Comments on General Conditions

B: Permit Expiration

This condition refers to the Board taking action on a permit application. The Board referred to is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by ' 2.1-20.01:2 and ' 10.1-1185 of the *Code of Virginia,* and the "Department of Environmental Quality Agency Policy Statement NO. 3-2001".

This general conditions cites the entire Article(s) that follow:
B.2. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources
B.3. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

This general condition cites the sections that follow:
B. 9 VAC 5-80-80. "Application"
B.2. 9 VAC 5-80-150. "Action on Permit Applications"
B.3. 9 VAC 5-80-80. "Application"
B.4. 9 VAC 5-80-80. "Application"
B.4. 9 VAC 5-80-140. "Permit shield"
B.5. 9 VAC 5-80-80. "Application"

STATE ONLY APPLICABLE REQUIREMENTS

There are no State-only applicable requirements identified in this Section of the permit.

FUTURE APPLICABLE REQUIREMENTS

40 CFR Part 64, Compliance Assurance Monitoring (CAM), applies to pollutant-specific emission units with pre-control device emissions of regulated pollutants exceeding major source thresholds. The units must have control devices in place and have applicable requirement for the subject pollutant. The rule requires sources to monitor the operation and maintenance of the control devices to ensure compliance with applicable requirements. The internal combustion engines at Washington Gas have pre-control device emissions of NO_x of greater than 50 tons per year and are subject to a RACT standard. Therefore, CAM is applicable to the engine catalysts. However, the CAM rule defines the engines as "other pollutant-specific emission units" and submittal of a CAM plan is not required until permit renewal. Furthermore, it is possible and even likely that the current periodic monitoring plan will satisfy the requirements of a CAM plan. Therefore, 40 CFR Part 64 is not listed as an applicable requirement.

INAPPLICABLE REQUIREMENTS

The source did not identify any inapplicable requirements.

COMPLIANCE PLAN

The source is currently in compliance with all applicable requirements.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, record keeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Table 3. Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation[1]	Pollutant(s) Emitted (9 VAC 5-80-720 B)	Rated Capacity (9 VAC 5-80-720 C)
10	Hitachi chiller	9 VAC 5-80-720C	PM/PM_{10}, SO_2, NO_x, CO, VOC	9.2 MMBtu/hr
12	Cummins diesel-fired emergency generator	9 VAC 5-80-720C	PM/PM_{10}, SO_2, NO_x, CO, VOC	268 horsepower
13	Miscellaneous natural gas-fired space heating units	9 VAC 5-80-720B	PM/PM_{10}, SO_2, NO_x, CO, VOC	Each less than 10.0 MMBtu/hr
14	Auto body paint spray booth	9 VAC 5-80-720B	VOC	---
15	Paint Spray Booth	9 VAC 5-80-720B	VOC	---
18	Volvo diesel-fired emergency generator	9 VAC 5-80-720C	PM/PM_{10}, SO_2, NO_x, CO, VOC	749 horsepower

[1] The citation criteria for insignificant activities are as follows:
9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application
9 VAC 5-80-720 B - Insignificant due to emission levels
9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The source did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

The proposed permit was placed on public notice in the Washington Times from August 13th, 2001 to September 12th, 2001.

APPENDIX A
2000 Emission Statement

APPENDIX B
NO_x RACT Consent Agreements

APPENDIX C
NO_x RACT Parametric Monitoring Plan